

# **ABBRIATA®**

## **USE AND MAINTENANCE HANDBOOK**

### **PICK-UP BALER**

**M 60 MINI/S M 60 MINI  
M 60 SUPER**

**CE**



**ABBRIATA S.R.L.**

**MACCHINE AGRICOLE**

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## WARRANTY

The machine built by the company is guaranteed for 12 consecutive months from the date of purchase, provided that it is used according to the instructions contained in the Use and Maintenance manual and operates under normal working conditions. It is only under these conditions that the manufacturer agrees to supply spare parts, at no charge, for those components which, in the opinion of the manufacturer, have production or material defects; or, in its unquestionable opinion, to make repairs directly or by using authorized personnel.

The buyer will pay for any labor and transportation costs relative to this warranty.

The warranty expires if the equipment was used without complying with the instructions contained in the Use and Maintenance manual, or if it was repaired, disassembled or modified by unauthorized workshops.

Spare parts replaced under the warranty must be returned to the manufacturer.


The warranty will not be valid for cases involving poor maintenance and abnormal use of the machine. Any disputes will be under the competence of the judicial authorities of Alessandria - Italy.

## INTRODUCTION

Read this manual carefully before using the machine.

This handbook conforms with EEC Machine Directive 89/392 and subsequent amendments.

The manufacturer reserves the right to make changes, without prior notice and without any sanctions, without affecting the main technical and safety data.

The symbol  WARNING calls the reader's attention to indicate that non-compliance may lead to personal injuries or death of the operator.

This publication is divided into chapters which discuss the relative machine use and maintenance operations.

Please follow these instructions to ensure the best machine operating efficiency.

It is recommended to use only original spare parts (consult the Spare Parts catalogue).

- This manual indicates the standards that will guarantee regular machine maintenance and use, thus avoiding problems which might damage the machine and reduce its operating performance.
- Despite the fact that technical service is available at any time, the manufacturer is not responsible for any non-compliance with the standards contained in this handbook.
- This machine was built for operations only for the agricultural sector and therefore the owner will be personally responsible for any improper use of the picker baler. Any other use is considered to be improper.
- In case of breakdowns, the machine must be repaired by skilled personnel under safety conditions in compliance with the accident-prevention standards and rules regarding technical safety, road traffic and job health.
- When the machine is delivered, check that the equipment has not been damaged during transportation and that accessories (if any) are complete. Claims will only be accepted in writing within eight days from the date of delivery.

## MARKING AND IDENTIFICATION

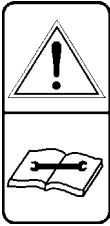
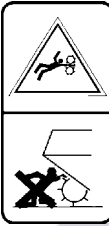
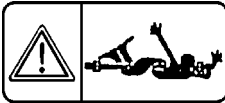
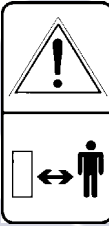



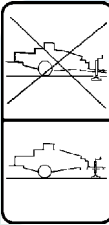
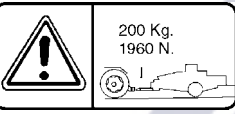
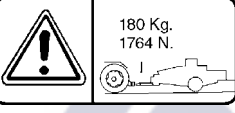

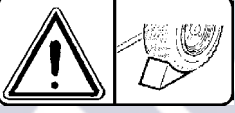
When the machine is received, check the marking on the cover of the equipment.



(EXAMPLE OF RATING PLATE)

Each machine is equipped with an EC rating plate and an EC declaration of conformity in accordance with EEC directive 89/392 and subsequent amendments.

## SAFETY LABELS

 <p>Before starting any operation, make sure you have read and understood this manual. All maintenance or modification work must be done according to the descriptions given in this manual. Failure to observe this may cause accidents or breakage of the machine.</p>	 <p>Switch off the tractor before acting on the pick-up.</p>
 <p>Keep clear of the cardan joint while the machine is running.</p>	 <p>Keep at a safety distance from the machine.</p>
 <p>The covers must be closed before starting the machine.</p>	 <p>Maximum rotation of the cardan shaft.</p>
 <p>You must insert or register adjust the belt only after removing the protection with the motor turned off.</p>	 <p>In the case of stopping the machine on especially soft ground you must use an additional foot support.</p>
 <p>200 Kg. 1960 N. ( M 60 SUPER)</p> <p>Indicates the maximum vertical load on the towing eye.</p>  <p>180 Kg. 1764 N. (M 60 MINI)</p>	 <p>While closing the rear chamber it is forbidden to put your hands between the covers.</p>
 <p>Caution: When the machine is disconnected from the tractor, use the supplementary chocks.</p>	





### WARNING!

- Do not leave the machine unattended when there are moving parts.
- Do not carry out any maintenance, lubrication, adjustment, cleaning, or any other operation when there are moving parts.
- All operations must be done with the machine stationary and with the tractor's engine switched off.
- Do not use the machine without guards.
- Whenever the operator has to get off the tractor, he has to disconnect the P.T.O., switch off the engine, pull on the parking brake and wait for all the tools to stop completely before getting off. Getting back into the driver's seat, the operator needs to make sure that earth or mud do not make the controls difficult for him.
- The machine can only be used if carried by a suitable tractor and controlled by a suitable cardan shaft, which takes its motion from the tractor's P.T.O.; all other uses are strictly forbidden.
- Other persons in addition to the operator are not allowed on board the tractor.
- It is not allowed to carry persons or objects on the equipment.
- During normal work keep people out the range of action of the machine.
- When working on slopes, keep to the tractor manufacturer's instructions to avoid turning over. In any case reduce your speed and handle with care.
- Before unhooking the equipment from the tractor, lean it on the ground and stabilize it with the stabilizer.
- After unhooking, check the stability of the equipment.
- Do not push the product into the collection apparatus using your hands or feet.
- When transporting the machine it is necessary to use the customary signals.
- The firm declines all responsibility should the above instructions not be observed.

### BASIC RULE

For safety purposes and to ensure correct machine operation, before starting the equipment it is recommended to check the operation of both the machine and the tractor.

### GENERAL SAFETY STANDARDS: USE CONDITIONS AND LIMITS



### WARNING!

- The manufacturer of the ball joint or cardan shaft is responsible for such components. For the cardan shaft or ball joint, the manufacturer of the universal joint will issue the prescribed EEC conformity declaration, together with the machine.
- Become familiar with the controls, the correct use of the machine and learn how to turn off the motor quickly. Do not remain in the work area.
- It is important to keep animals and other persons away from the machine. Do not allow the machine to be used by children or unskilled persons.
- During operation, it is recommended to wear suitable clothing and heavy shoes (loose-fitting clothes are prohibited).
- Make sure that you have mounted the guards, safety devices and protection systems in accordance with the prescribed standards.
- Have defective or damaged parts repaired or replaced.
- Work during the day or with adequate artificial light.
- Stop the machine before crossing streets, paths or gravel-covered roads.
- If you collide with a heavy object or if the machine vibrates excessively stop the motor, check for damage and have skilled personnel make all the necessary repairs before re-starting the machine.
- When you decide to leave the tractor, turn off the motor and remove the ignition key from the instrument panel. Before getting close to the machine, wait for all moving parts to stop turning.
- Do not place hands and feet close to moving machine parts.
- Always keep in mind the use accident-prevention standards. Therefore, to ensure correct use, it is absolute essential to refer to the warning signals.

- Before starting any type of operation, the operator should become familiar with the machine, its parts and the relative functions and, especially, when driving on the road, must respect the current traffic rules and regulations.
- Always check that the machine is perfectly clean to avoid dangerous accidents. While working, never transport other persons on the machine.
- If the picker becomes jammed, clean it only when the motor is turned off.
- Be extremely careful when unloading and closing the binding chamber.
- Do not use the machine near other persons.
- The machine should be cleaned with the motor off and the machine stopped.
- Do not tamper with the controls and the safety systems.
- The machine must be assembled in accordance with the instructions.
- Use the necessary caution during machine assembly and disassembly operations or when disconnecting the machine from the tractor. Always check the loads per axle, the overall weights and dimensions allowed for transiting.
- Make sure that lighting, warning signal and protection devices have been installed and install them if they are missing.
- The machine running speed must be compatible with the environmental conditions and avoid any brusque steering movements while moving uphill or downhill. Do not work on very steep slopes.
- The machine can be started only when the relative protection devices have been installed.
- It is absolutely prohibited to remain in the work area and in the vicinity of the machine while it is operating and moving.
- Make sure that there are no persons near the machine during operations which may involve tilting hydraulic parts. The parts driven by external forces have sharp and pointed ends.
- If brakes and stop devices are not activated, it is absolutely prohibited to remain between the machine and the tractor.
- Do not operate the machine in closed rooms.
- The machine is equipped with wheel blocking wedges which must be used immediately each time the machine is disconnected from the tractor. These wedges are kept inside the container that houses the string roll.

**WARNING!**

- During operation, persons or animals should not get closer than 40 meters from the machine!
- Therefore, stay far away from the rear mobile chamber of the machine which expels the bales, thus creating a dangerous situation.
- It is recommended to use protective earphones when using the tractor without a sound-proof cab (only if the noise exceeds about 85 dBA).

**POWER TAKEOFF****WARNING!**

- Only EC marked universal joints can be used with the machine and the user must follow the instructions contained in the "use and maintenance" handbook issued by the universal joint manufacturer.
- The protection bar and the universal joint protection hopper, as well as the power takeoff guard must be installed in the proper position.
- The cardan shaft can be mounted and removed only if the power takeoff is disconnected, the motor is off and only if the ignition keys are not inserted in the instrument panel.
- Make sure that the cardan shaft is installed properly and correctly install the protection bar and the relative protection hopper.
- Make sure that the chains are applied to the protection device of the cardan shaft to prevent it from turning by itself.
- Before inserting the power takeoff, check that the number of turns of the machine is the same as that of the power takeoff of the tractor and that no one is present in the hazardous area of the machine.
- It is prohibited to insert the power takeoff when the motor is on.
- During work operations with the power takeoff it is prohibited to remain in the vicinity of the cardan shaft or the power takeoff and the power takeoff must be disconnected if the angles are too high.
- Do not get too close to the machinery even when the power takeoff is disconnected.
- To clean or lubricate the machine or to perform maintenance operations and repairs, turn off the motor, disconnect the power takeoff and remove the keys from the instrument panel. The cardan shaft, once disconnected from the power takeoff, must be held by the special support so that it does not touch the ground and become damaged or dirty.
- The P.T.O. protection casing must always remain at least 50 millimeters above the universal joint protection casing.

### START-UP

Do the following before starting the picker:

Check all the lubrication and greasing points. Make sure that the nuts and bolts have not become loosened and tighten them, if necessary.

**ATTENTION!** The machines are delivered without oil. Before putting in operation, verify the oil and introduce oil SAE 90 (differential) in the reduction gear carter up to level.

### TRACTOR-BALER COUPLING

The picker baler is connected to the fixed bar of the tractor and is driven by the power takeoff with clutch. Therefore, position the machine, using the support foot, on a horizontal plane so that the binding chamber is parallel to the ground. Couple the machine with the tractor in reverse gear, positioning the towing eye at the required height (adjusting the position of the tractor height, if necessary) making sure that it is properly connected.

Then raise the support foot, placing it in the working position.

Mount the cardan shaft supplied with the machinery and make sure that it is perfectly locked into position on the power takeoff and that in any position it will not pull out or jam.

The coupling eye must be arranged as shown in Fig. 1.

The coupling fork of the tractor and the towing eye of the baler must be arranged so that the binding chamber is parallel to the ground. The eye must be between 30 and 40 cm from the power takeoff (Fig. 1).

Incorrect coupling to the tractor will make the cardan transmission joints operate under abnormal loads and will lead to abnormal operation of the baler and may damage the relative parts.

Before starting the baling operation, move the drawbar of the baler to the left to the working position.

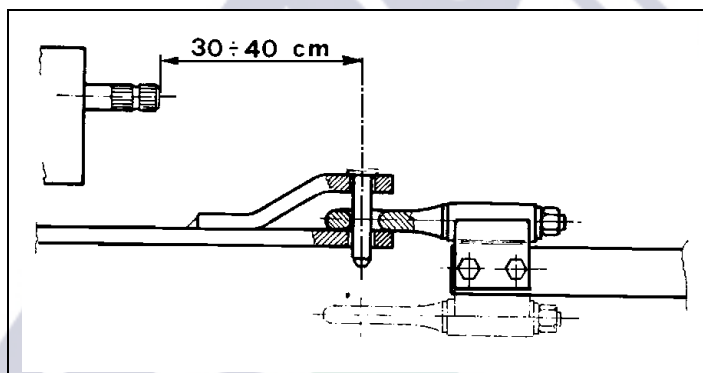


Fig. 1



### WARNING!

Avoid tight curves while operating the baler. To avoid damage to the cardan shaft in tight curves, disconnect the power takeoff of the tractor.



## PROTECTION DEVICES



### WARNING!

Any protection devices must always be closed before starting the machine and should be opened only after stopping the machine, turning off the tractor motor and removing the ignition keys.

### MOUNTING THE STRING

1. Insert the rolls of string into the special container which must be type 180 - 200 meters per kg or nylon reels, type 350 meters per kg. Make sure that the reels are located in the container so that by pulling the central end of the string it unwinds in a counterclockwise direction. This will prevent the string from becoming tangled while it is unwound.
2. Thread the string as indicated in Fig. 2 and Fig. 3.
3. Tie the ends of the string to the bottom cross member of the binding chamber (Fig. 3).
4. Completely lift the lever 1 shown in Fig. 4 turning the metric wheel 2 in Fig. 4 to engage the binder.
5. Turn the flywheel in its rotation direction until the needles are positioned in the starting point (the needle arm must be in the resting position - needles retracted).
6. Remove the two pieces of string that are still tied to the cross member.

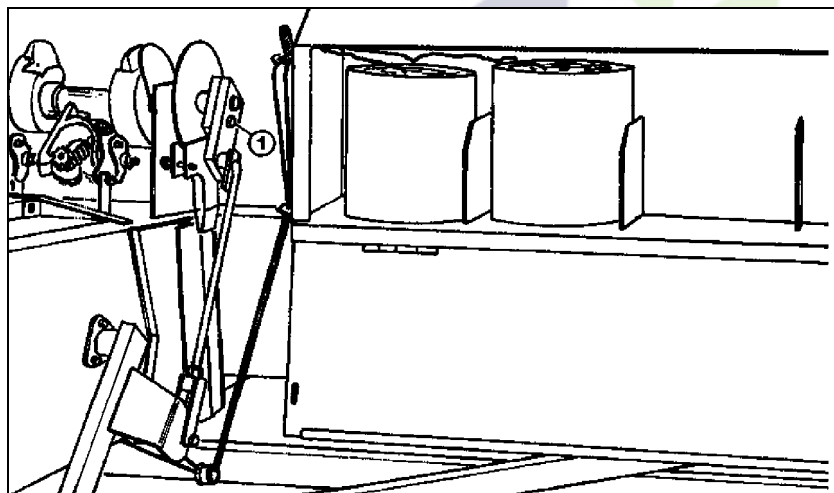


Fig. 2

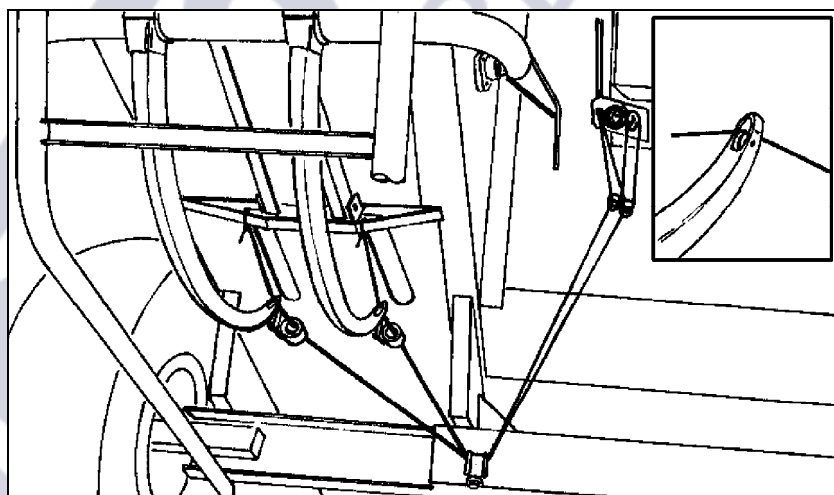


Fig. 3

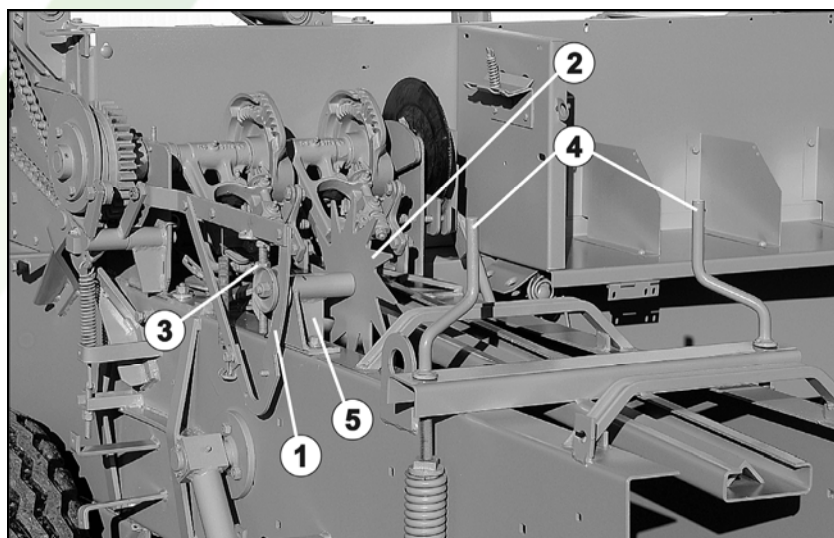


Fig. 4

### OPERATING PROCEDURE

The balers are delivered so that they can be started without requiring any preventive operations.

Do the following to start the machine:

1. Lower the bale unloading platform and reduce the tension of the compression springs of the binding chamber using the handles 4 shown in Fig. 4.
2. Adjust the height from the ground of the picker in relation to the material to collect and the type of soil on which to operate the baler by using the ratchet 1 shown in figure 5 after releasing the rod 2 shown in Fig. 5.
3. Engage the power takeoff of the tractor after connecting the cardan shaft and set the baler operations to 90 beats per minute. (It is simple to check the number of beats - just count the number of rpm of the feed forks).

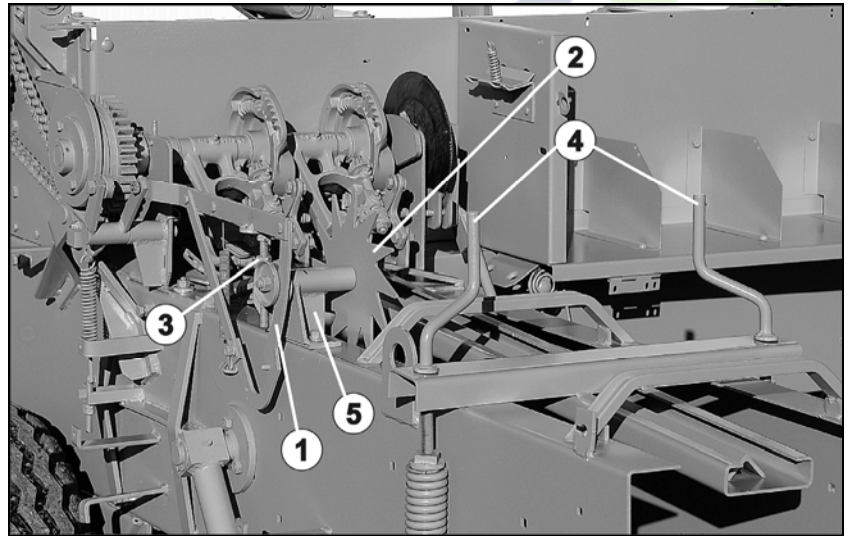


Fig. 4

#### DRAWBAR VERSION WITH HYDRAULIC PISTON



#### WARNING!

When transporting the machine version equipped with a drawbar and a hydraulic piston, piston operation can be inhibited by removing the piston connection latch and by clamping mechanically the drawbar.

#### LIFTING THE MACHINE

To lift the machine use the special connector or hooks located at the top of the machine.

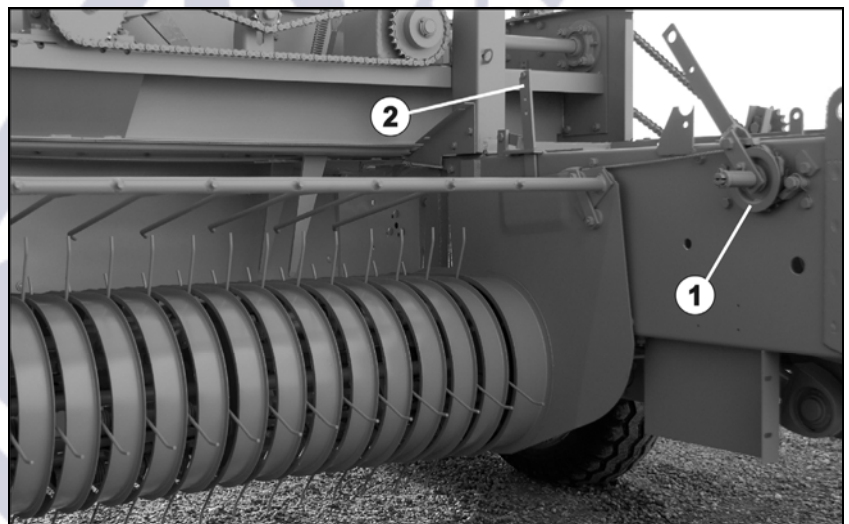


Fig. 5

## LUBRICATION

The balers are built to require a minimum lubrication. However, it should be recalled that the time required for lubrication is not wasted since it protects the machine against costly breakdowns and considerably extends its service life.

Lubrication must be performed at the beginning of each working day. The oil level in the pan of the main reducer and the grease in the crown wheel and pinion can be checked much less frequently, i.e. once every month unless lubricant begins to leak from the machine.

**ATTENTION!** The machines are delivered without oil. Before putting in operation, verify the oil and introduce oil SAE 90 (differential) in the reduction gear carter up to level.

The parts to be lubricated are identified by special stickers applied on those parts.



### WARNING!

Hydraulic piping may rupture. Therefore, check for any leakage of hot oil under pressure.

The operating pressure is 330 bar.

The bursting pressure is 1450 bar.

The piping and the hydraulic components conform with prEN 982.

### RECOMMENDED LUBRICANTS:

Premium viscous grease - Oil SAE 90-120 (differential).



### WARNING!

Do not forget to lubricate the greaser fitting located on the flywheel if not assembled on self-lubricating bearings.

## SAFETY DEVICES

All the baler parts are protected by devices designed to interrupt the transmission when abnormal operation occurs.

### CLUTCH ON THE FLYWHEEL

The clutch on the flywheel is designed to protect the cardan transmission shaft. It should never slip during normal operation of the baler.

It can be adjusted by means of bolts (no. 3 Fig. 6) which compress the springs (which should never be fully tightened). The free release device is lubricated by means of the grease nipple 2 in Fig. 6.

### SAFETY BOLT ON THE FLYWHEEL

This bolt is designed to protect the main reducer against overloads.

The bolt is 8 x 60 mm and built with material with a resistance of 80 kg/mm<sup>2</sup> (no. 1 Fig. 6).

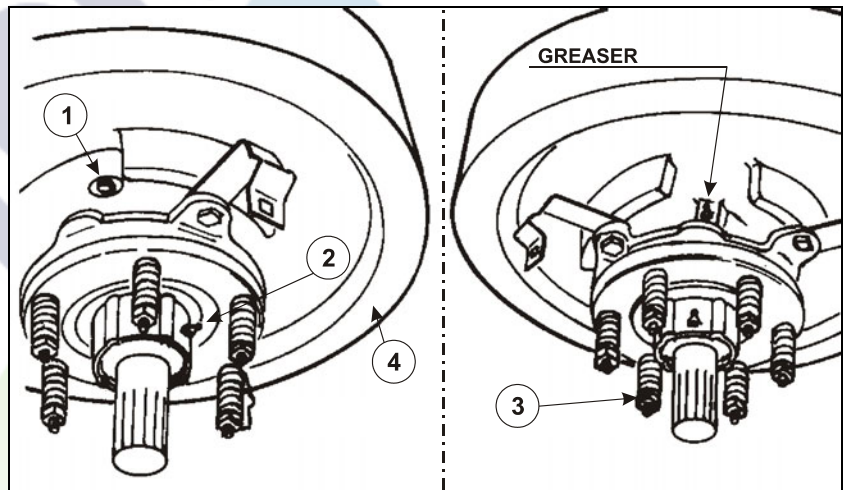


Fig. 6



It comes into action when the layer of the material that the piston knife must cut when baling is too thick and generates excess cutting force, or when the binder needles, during the binding operation, did not come out at the right time from the binding chamber and could not return the piston pawl (no. 1 Fig. 7).

Frequent breaking of the safety bolt may be caused by the following:

1. Incorrect knife adjustment (Fig. 8) or bad condition of their cutting edge.
2. Too much compression of the bales with strong feeding.
3. Piston does not slide well due to incorrect adjustment of its guides.
4. Incorrect adjustment of the piston pawl.
5. Bolt cutting bushes bent or broken.

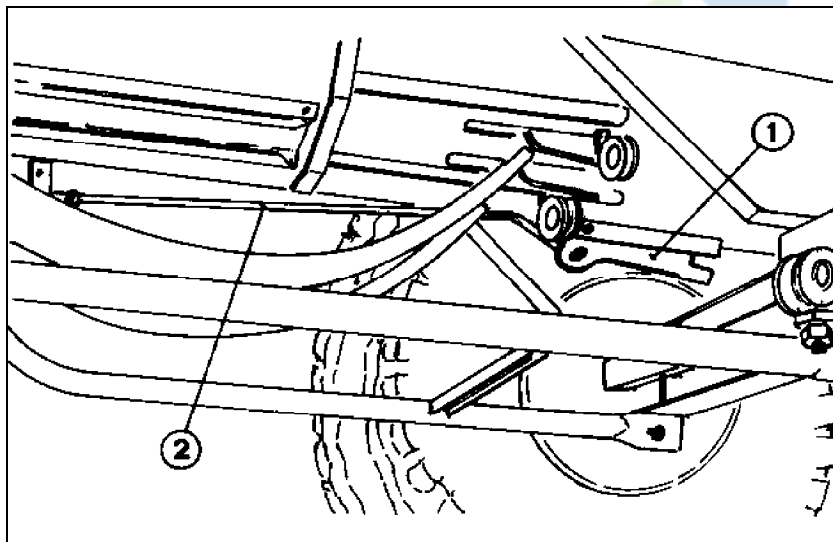


Fig. 7



### WARNING

To extend the service life of the safety bolt, check that it is properly tightened. When the safety bolt is cut, wait until the flywheel stops before replacing the bolt.

### SAFETY ON THE PICKER CONTROL SHAFT

The same picker control belt protects the various picker parts.

It should never slip during normal baler operation.

It slides when the picker forces against excessive resistance.

It can be adjusted using the take-up device (no. 8 Fig. 12).

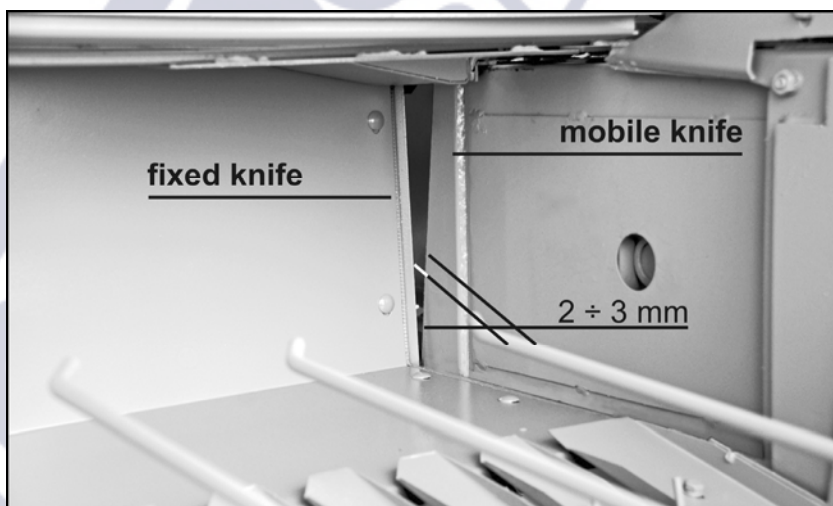


Fig. 8

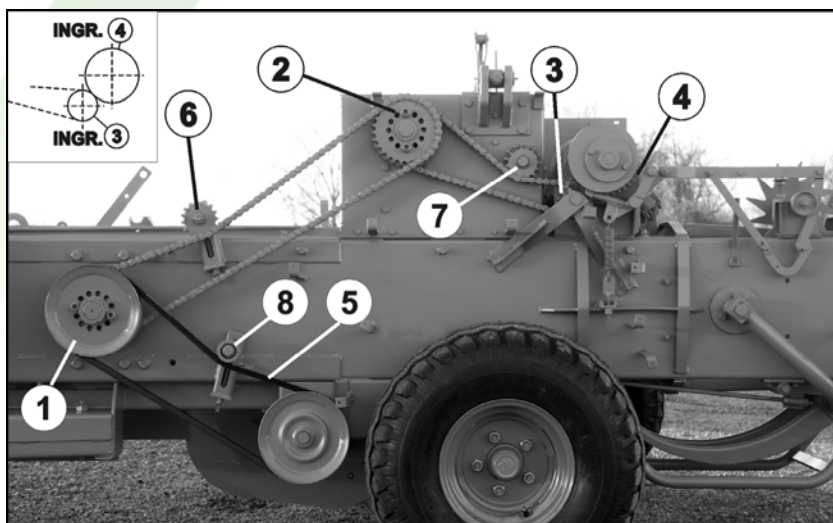


Fig. 12

## JAMS

If a large jam occurs, disconnect the power takeoff, turn off the tractor, remove the key from the instrument panel and manually clear out the jam.



### WARNING!

Do not get close the machine when it is jammed except if the power takeoff is disengaged, the motor is off and having removed the key from the instrument panel.

## MAINTENANCE

- Disconnect the tractor power takeoff, turn off the motor, remove the keys from the instrument panel: now you can continue with the maintenance, cleaning and repair operations.
- Always use the blocking or closing devices before performing any maintenance or repair work.
- To replace tools, use suitable gloves and tools. To ensure machine stability, it is recommended to perform all operations on stable support elements.
- Replace inadequate protection devices and remove grease and oil as soon as it becomes necessary.
- If electric welding is performed on the machine-tractor coupling, make sure to disconnect the generator and battery cable.
- Check that the spare parts are original, i.e. those that are recommended by the manufacturer and check at the beginning of each job that the screws are tightened to prevent them from becoming loose.



### WARNING!

If the binding unit is uncovered during use, due to functional reasons, the operator must be very careful to avoid all possible risks.

### SAFETY BOLT ON THE BINDER CONTROL CAM

This bolt is designed to protect the various components of the binder if abnormal resistance is generated in the unit.

The bolt has Ø 6x50 mm and built with material with a resistance of 80 kg/mm<sup>2</sup> (no. 1, Fig. 2). This bolt is used when the needles, while moving, strike some obstacle due to rough ground or when the needles, being shifted from their correct adjustment setting strike against some part of the baler.

The bolt may also be used when the binder does not slide well due to poor lubrication or cleaning or when the brake (Fig. 9) is too tight.



### WARNING

Before performing any maintenance work on the binder unit use the manual device to block the needles and the binder.



### WARNING!

After the first 15-20 hours of service it is recommended to check that the needle brake is operating properly. To adjust it, use the bolt (no. 3, Fig. 9).

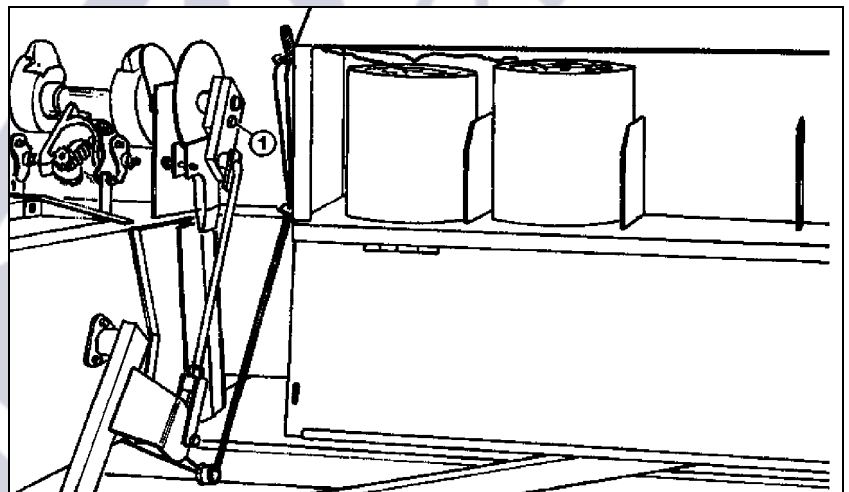


Fig. 2

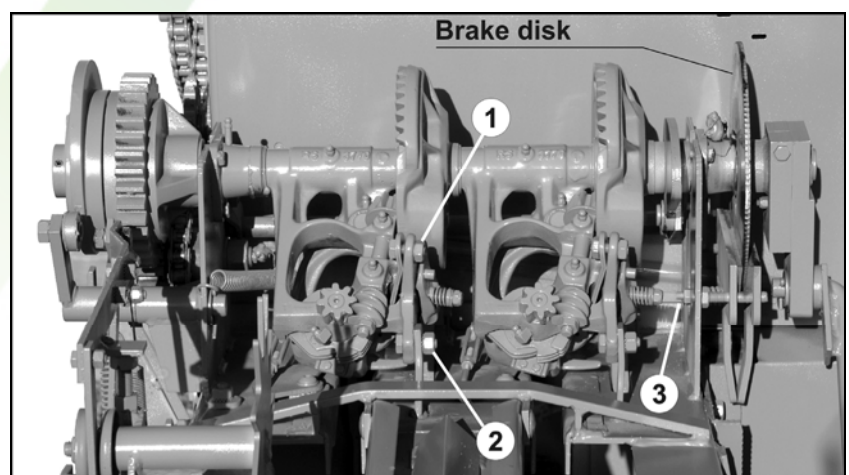


Fig. 9



### PISTON PAWL

This component is designed to protect the binder needles.

It has a metal tooth (no. 1 Fig. 7) controlled by the needle arm by means of the coupling device 2 in Fig. 7.

It is correctly adjusted when during the return movement of the needles the point of those needles and the pawl are flush with the bottom edge of the compression chamber, while the distance between the carriage striker (plunger) and pawl is 9-11 cm. - Fig. 13ter.

Use the nuts 3 shown in Fig. 11 to adjust the pawl. When the safety bolt is cut on the flywheel, since the pawl was activated, the causes, excluding poor adjustment, may be:

1. The binder safety bolt was cut (no. 1 Fig. 2 for which the needles could not be extracted from the binding chamber.
2. The tractor power takeoff was disconnected while the needles had begun their binding movement.
3. The needles are not properly timed with the piston.

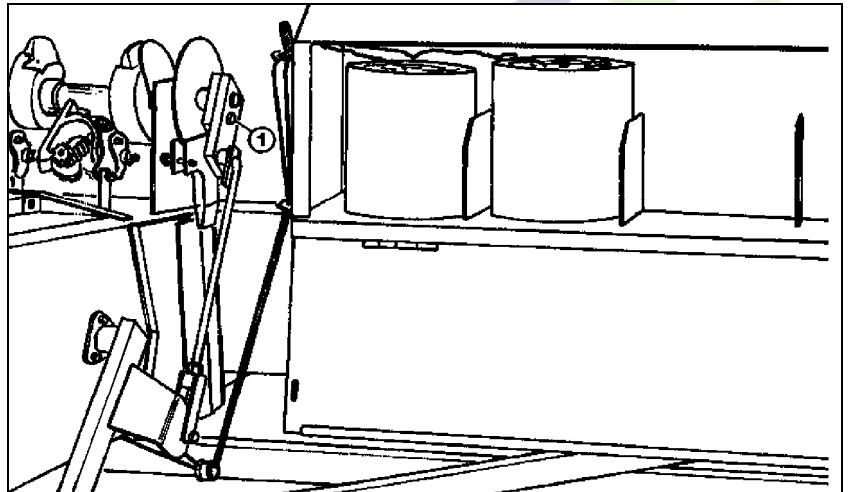


Fig. 2

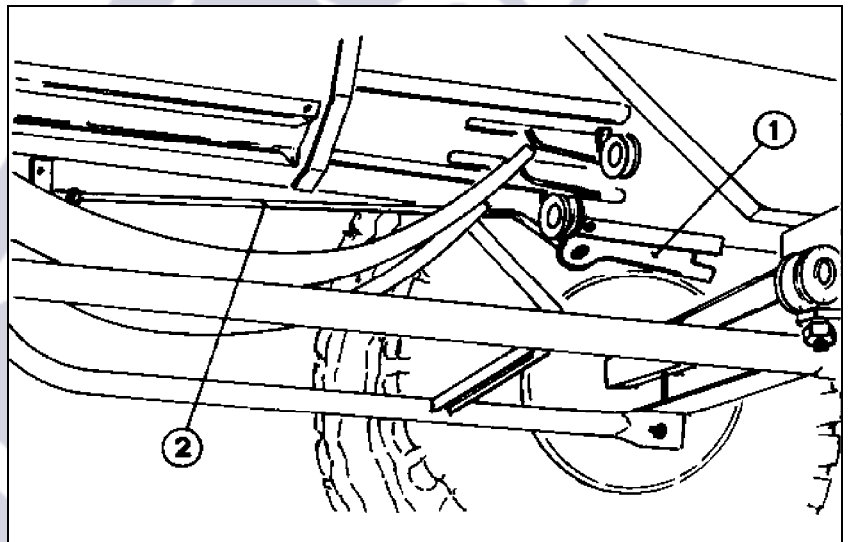


Fig. 7

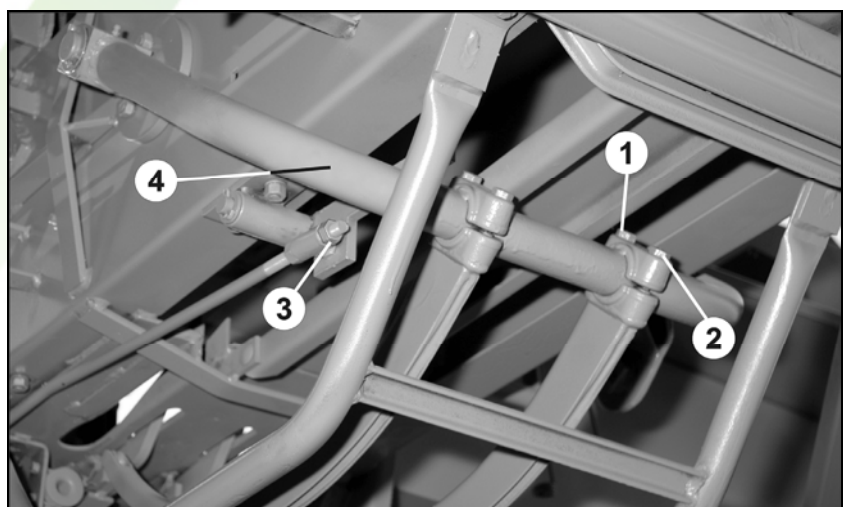


Fig. 11

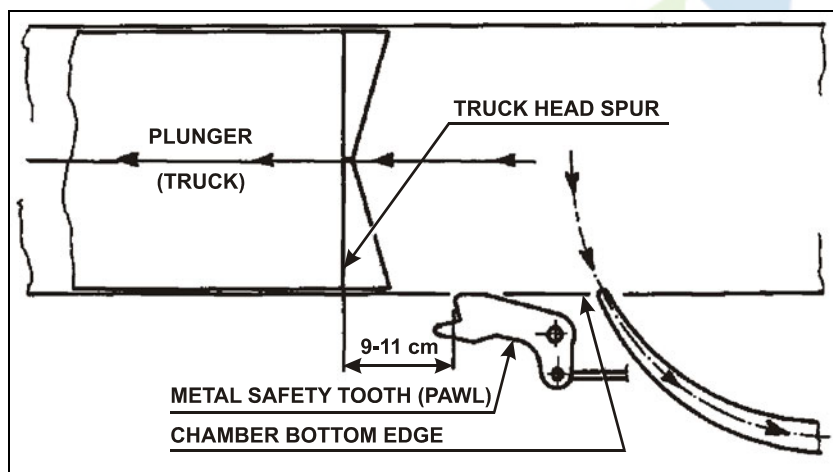


Fig. 13 ter

**WARNING!**

Before disconnecting the tractor power takeoff make sure that the binder is not operating.

**FORK SAFETY BOLTS**

This bolt is used to protect the feed forks if they create abnormal resistance. The bolts have a  $\varnothing 6 \times 50$  for the first fork;  $\varnothing 6 \times 50$  for the second fork of material with resistance of  $80 \text{ kg/mm}^2$  (no. 1 and 2 Fig. 10). They operate when the forks, while moving, encounter resistance caused due to picking of a foreign body, an excessive amount of product or, due to poor timing, the first fork strikes the piston.

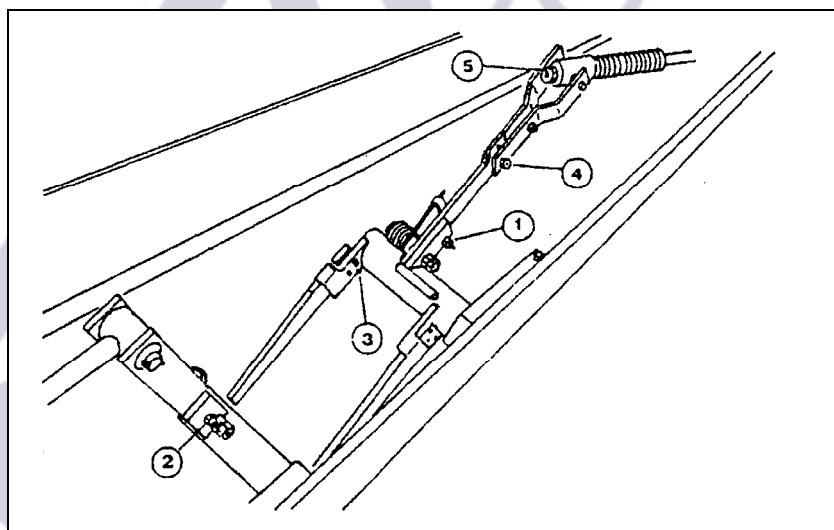


Fig. 10

### PHASE

Phasing of the machine is carried out in two times: first, phasing of the forks with the truck, then phasing of the binder/needles with the truck.

#### A) Phasing of the forks with the truck

- Linking is carried out by means of the gear chain no. 1 Fig. 12 with the gear driving the forks of the double gear no. 2 Fig. 12, the gear no. 1 Fig. 12 being still idle on its own axis.
- The truck is put forward and the crank of the 1st fork is placed so has to have a distance from the truck head spur of approximately 65÷95 mm if the fork is mounted with its side bent towards the compression chamber or approximately 45÷65 mm if the fork is mounted with its side perpendicular to the compression chamber (see Fig. 12 bis). In these conditions, the gear no. 1 Fig. 12 becomes integral with its axis by means of the special socket head screws. The system of opposite multi-hole flanges makes it possible to lock the gear in the required position with a minimum deviation.
- Once phasing of the 1st fork with the truck is obtained as mentioned above, it is proceeded to phasing of the 2nd fork by carrying out linking, by chain, the gear 2 bis with the gear 2 ter Fig. 13, after having placed the crank of the 2nd fork parallel to the crank of the 1st fork in case of the M. 60 Mini and M. 60 Mini/S, or perpendicular to the crank of the 1st fork in case of the M. 60 Super (see Fig. 13). For long and tough products, it is recommended to time the 2nd fork as shown in Fig. 28 or Fig. 29 in page 19.

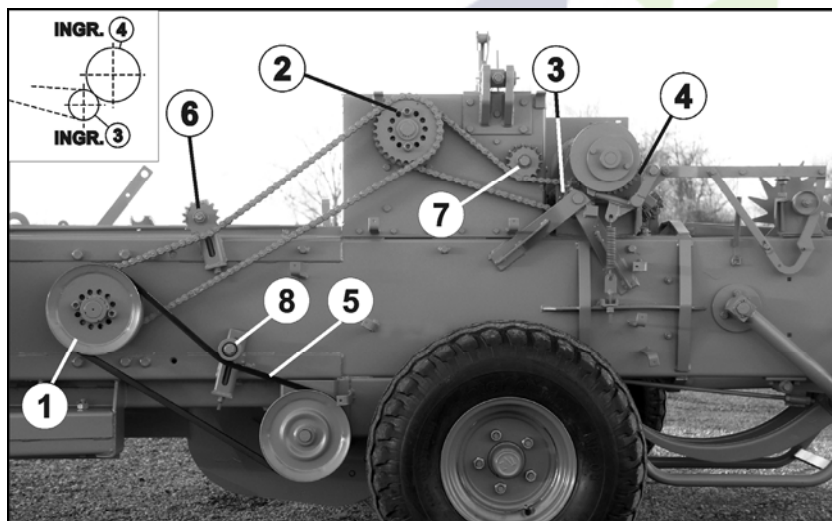


Fig. 12

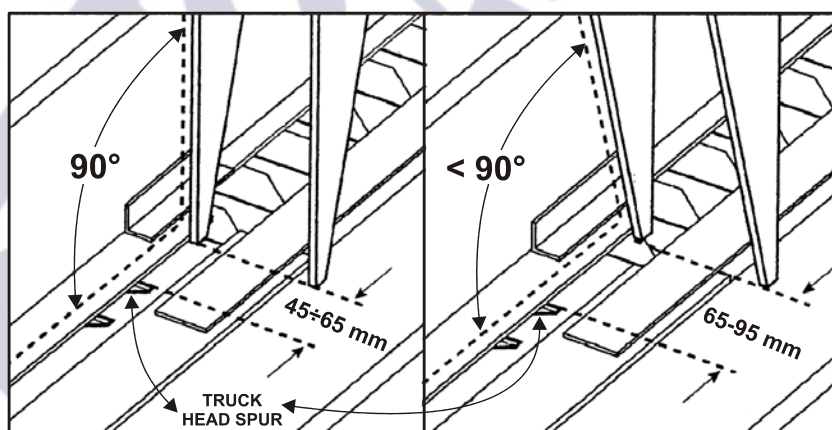


Fig. 12 bis

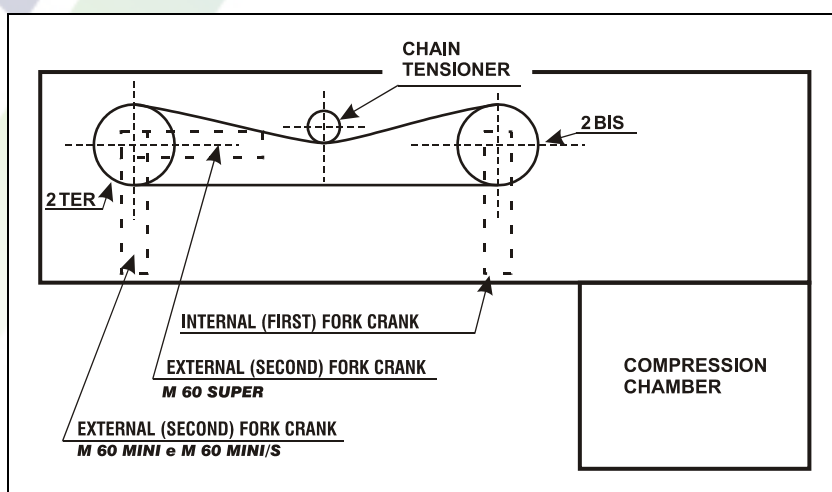


Fig. 13



### B) Phasing of the binder/needles with the truck

Once the fork/truck phasing has been carried out, it may be proceeded to phasing of the binder/needles with the truck, as follows:

- The needles are placed in rest position by moving backward the needle arm no. 4 Fig. 11 to the upper end of stroke.
- Coupling of the binder is carried out bringing to its maximum height the sector lever (no. 1 Fig. 4) by rotating the ball spacing, star type wheel no. 2 Fig. 4 then the bell gear no. 10 Fig. 15 is rotated until it is locked in the position of binding shaft dragging.
- By pushing downwards the needle arm no. 4 Fig. 11, bring the needles in such a position as to have their point at the level of the lower edge of the compression chamber Fig. 13 bis; then, by rotating the flywheel no. 4 Fig. 6, bring the truck in such a position as to have its front spurs at approximately 0-15 mm. from the point of the previously positioned needles (see Fig. 13 bis). The needles and the truck being placed as mentioned above, the position of binder drive transmission gear of the double gear no. 2 Fig. 12 is locked by means of a socket head screw.
- The system of opposite multi-hole flanges makes it possible to lock the gear in the required position with a minimum deviation.

Once the sequence of operations A and B is carried out, the machine is fully phased.

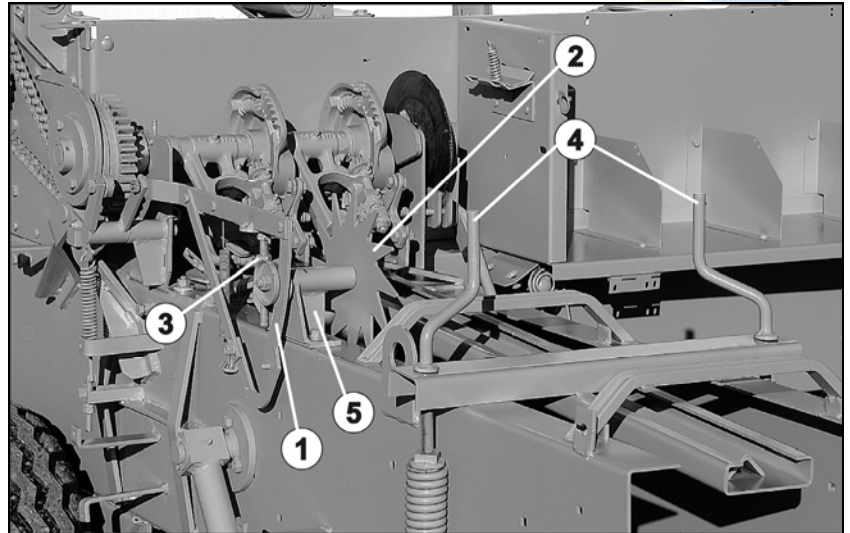


Fig. 4

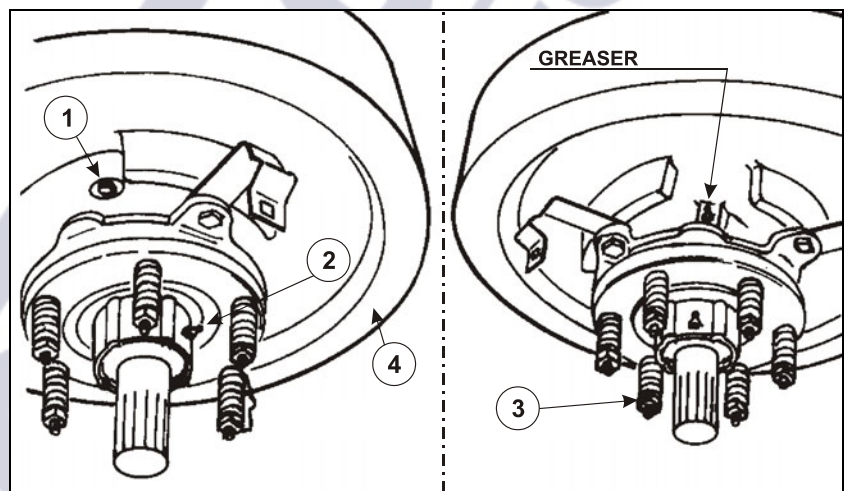


Fig. 6

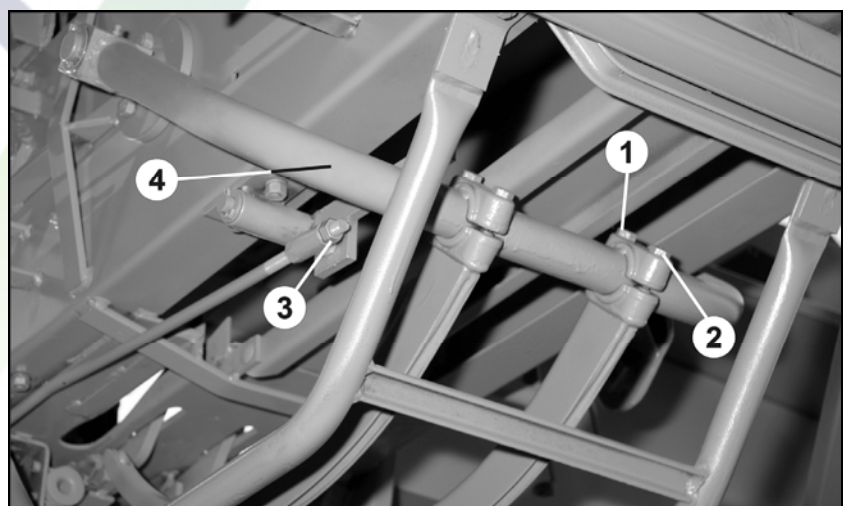


Fig. 11



### WARNING!

**ATTENTION** Control of the machine phasing is made much easier by the presence of reference punches between the fixed and the moving parts, which must correspond when the machine is phased.

To avoid out-of-phase due to chain extension, always keep the main chains stretched by acting on the special tighteners.

N.B. In case it is necessary to disassemble the whole binding unit, it is necessary to reassemble the binding unit prior to carry out phasing, observing the meshing between gear 3 and 4 as shown on Fig. 12 (the O marked on gear 4 must be between both O marked on gear 3).

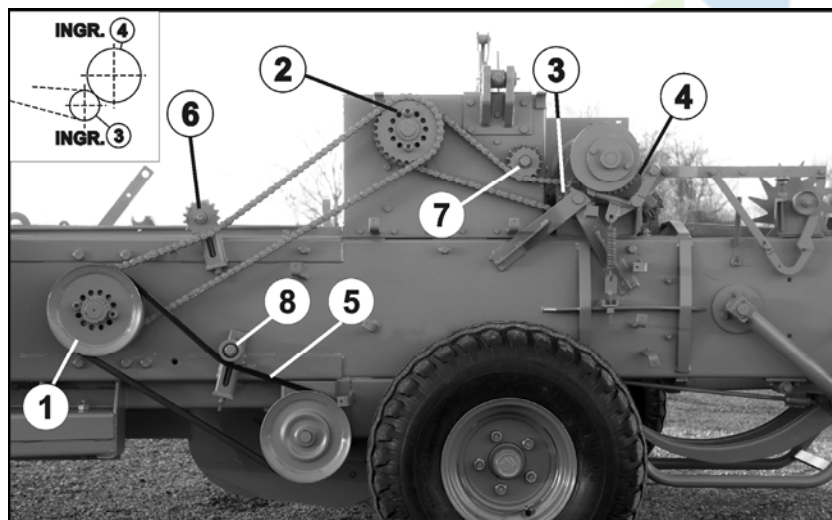


Fig. 12

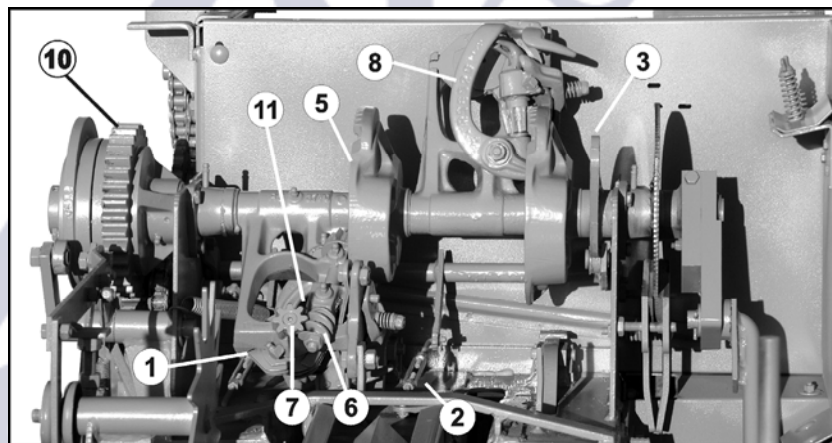


Fig. 15

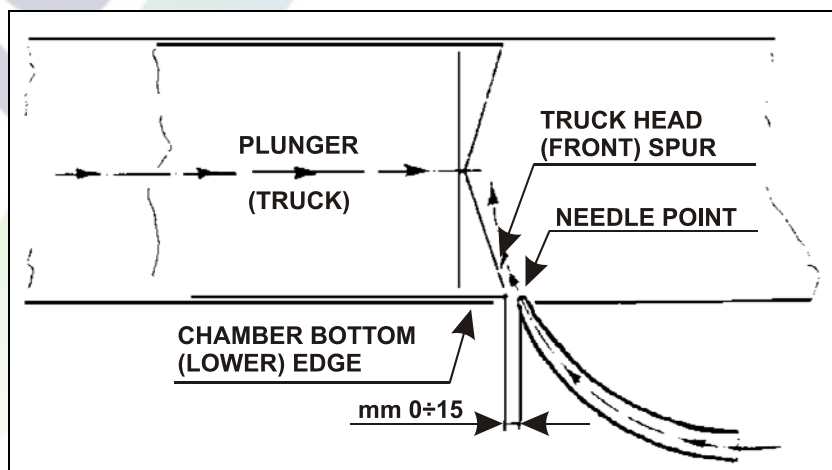


Fig. 13 bis



## RECOMMENDED TIMING 2nd FORK “M60 SUPER” IN PRESENCE OF LONG AND TOUGH PRODUCTS

It is recommended to time the 2<sup>nd</sup> fork according to the 1<sup>st</sup> one, which remains in its position as described on page 16 (see Fig. 28 or Fig. 29 represented here).

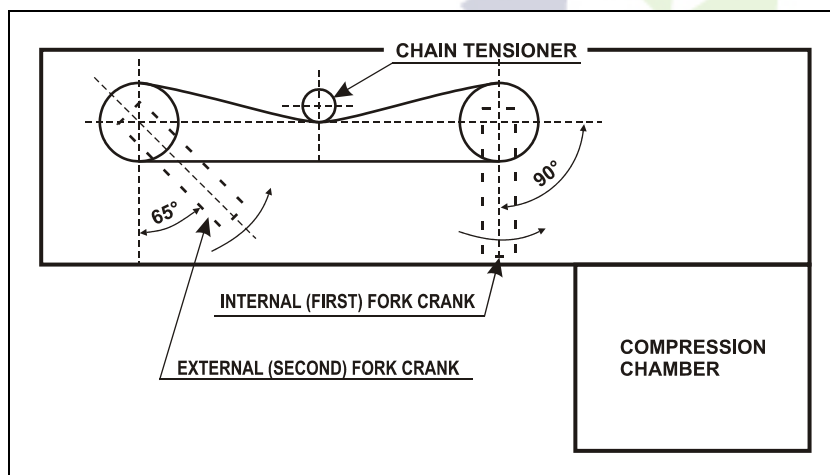


Fig. 28

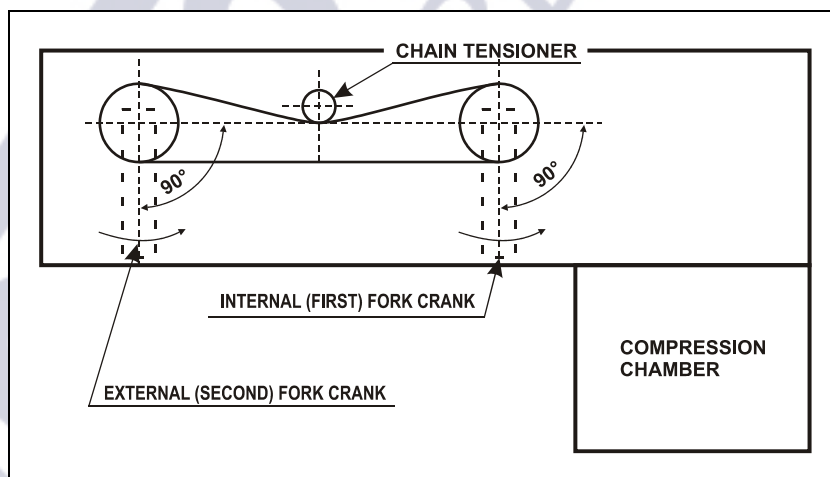


Fig. 29

### BALE CHARACTERISTICS

#### BALE LENGTH

The adjustment is made on the ring adjuster (no. 3 Fig. 4) after having loosened its fixing screw.

To obtain longer bales, shift the ring to the top.

To obtain shorter bales, shift the ring to the bottom.

The bales length may be varied from 30 up to 130 cm.

The irregular bale length can be caused by the following reasons:

1. Irregular feeding of the baler, above all when operating in a stationary place.
2. Variation of shape of arch lever (no. 1 Fig. 4). Its shape is perfect when all its bent side is located at the same distance from the rotation fulcrum (no. 1 Fig. 14). To avoid deformation, never try to set the arch lever to rest position, after having run the bale tie.
3. Wrong position of the metering wheel support (no. 5 Fig. 4). The position of the metering wheel must determine the position of the trip lever that can be seen at item no. 3 Fig. 14: which means that the trip lever top must be linked to the edge of the dogtrip (no. 2 Fig. 14). To change the position of the metering wheel support it's necessary to work on its own fixing bolts.

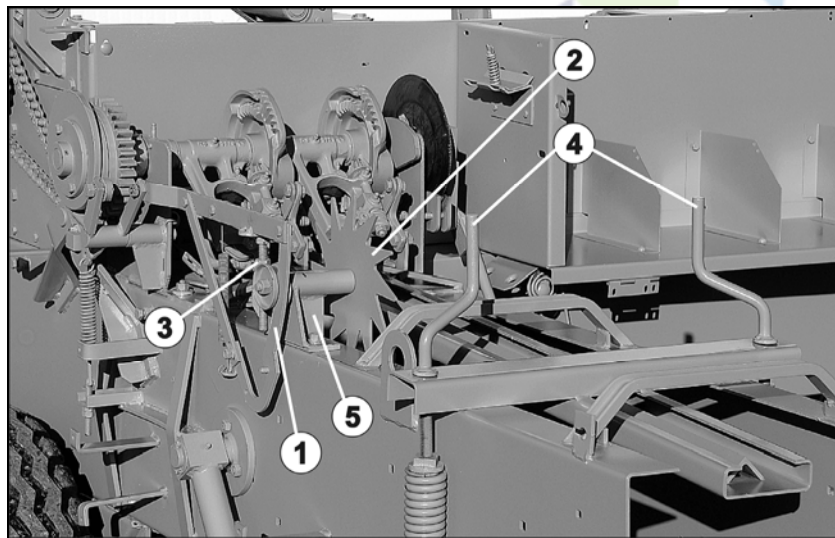


Fig. 4

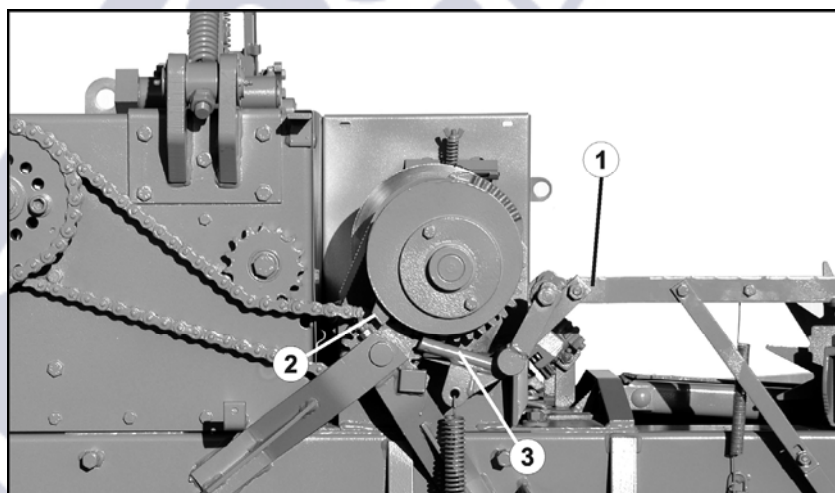


Fig. 14

#### BALE WEIGHT

It is determined by the quality of material to be pressed, density of the same and bales length.

To increase the density straw-stop wedges are engaged (no. 3 Fig. 25) in the relevant holes of the compression channel (no. 3 Fig. 26). Density may be regulated acting on handles no. 4 Fig. 4.

A variation of density is also possible by changing the intensity of feeding: the higher the feeding the lower the density.

For the growing of humidity, during evenings and nights, it is necessary to reduce the pressure induced by the handles.

The experience will teach the operator the correct regulation to obtain the wished bale weight under every packing condition.

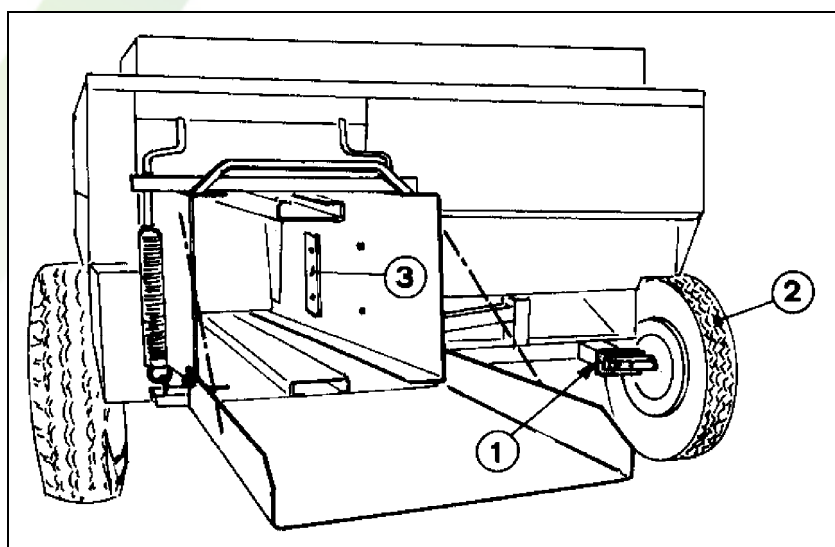


Fig. 25

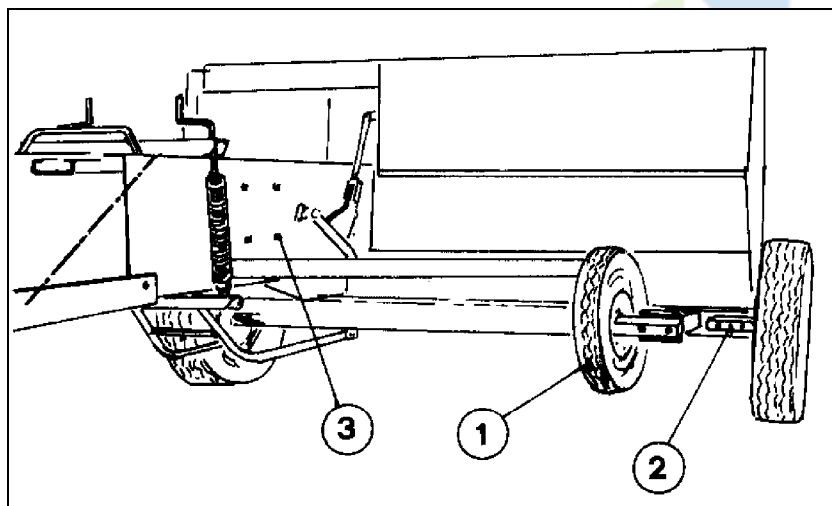


Fig. 26

### BALE SHAPE

The first rule to obtain bales of perfect geometric shape is to feed the baler steadily, with no overloads.

In case the bales result more compressed at the side of cut, it is either necessary to mount the compression chamber acting on the three fixing screws no. 3 Fig. 10.

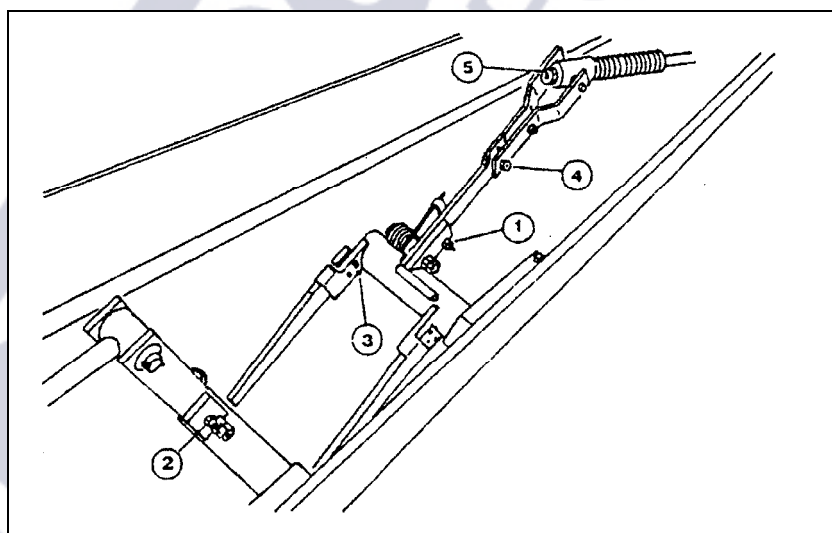


Fig. 10

## ADJUSTMENTS

### BINDER BRAKE ADJUSTMENTS

This brake (Fig. 9) is designed to make the motion of the binder uniform during the binding cycle and to keep it still during the period in which it is not in use.

The adjustment is performed by using the special screw to increase or decrease the compression on its spring (no. 3 Fig. 9).

### KNIFE ADJUSTMENT

The knives (Fig. 8) are designed to separate the subsequent layers of material introduced by the feed forks in the binding chamber.

It is very important to adjust the knives to obtain quality bales and to avoid frequent breakage of the safety bolt on the flywheel.

The distance between the fixed knife to the baler chamber and the fixed knife on the piston must range between 1 and 2 mm along the entire length.

The distance between the knives can be varied by changing the position of the angular knife connected to the piston by means of bolts on slots.

Before changing this distance, if it is different from the prescribed distance, check the adjustment of the piston side guides.

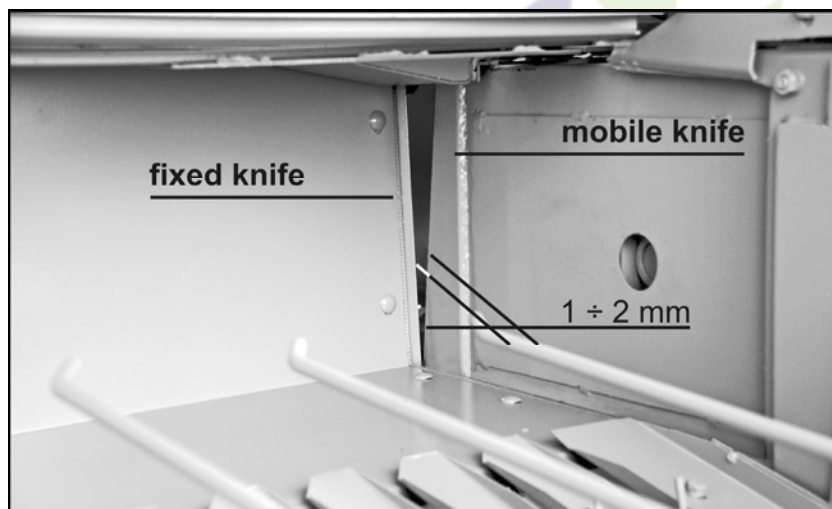


Fig. 8

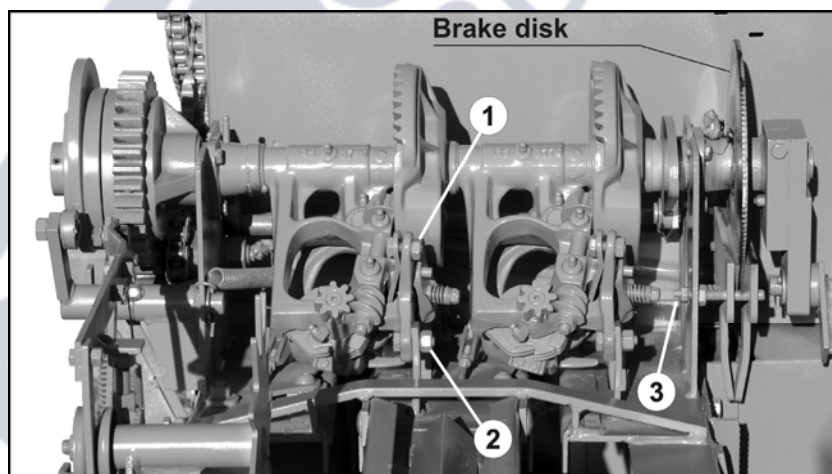


Fig. 9

### PISTON GUIDE ADJUSTMENT

The piston is set on self lubricating bearings and it is driven by steel blades.

In the bale chamber it runs on adjustable steel guides. The lateral adjustment must be made to let the piston have 0.5 mm. space where it can move. Notwithstanding the minimum space, the piston must not be stopped in its movement.

Such adjustments have to be made very rarely unless you notice that the piston has little smoothness.

The adjustment to the height can be made working on the eccentric pivots of the bearing after pulling out the piston from the bale chamber.

In the case that the rails where the piston runs are obstructed by loam or by other products it is necessary to pull out the piston from the bale chamber and to dismount the rails, clean them and remount them.

The lateral adjustment is made through the pressure screws that can be seen on the external side of the bale chamber. Naturally, before working on these screws it is necessary to release the rails which are fixed with bolts within easy reach.

## PICKER

This component collects the material to be baled and conveys it to the feed forks. For this purpose a certain number of spring-loaded teeth pass over the ground and after lifting the material to the maximum height determined by their rotation, they retract with a movement defined by a special cam.

The spring-loaded teeth, and in particular when the machine is working on uneven ground, may bend or break. To replace them, disassemble the plates of the picker casing.

It is important to straighten any spring-loaded teeth which may have been bent during use and to replace those which have broken.



## FUNCTIONING OF THE TWINE KNOTTERS

The head of the forming bale, makes the twine move forward with itself, the twine - held at one end by cord holder disc (no. 1 Fig. 15) - is drawn out of the little box where the balls are. When the bale reaches a certain length (no. 1 Fig. 4) the arch lever is brought by the advancement of the bales to the maximum height causing the operation of the bale-tie.

In such conditions the bell gear (Fig. 15), with its rotation at the right moment of the phase makes the tier process start as follows:

1. The needles, moved by the drive crank, bring the twine to the knotters.
2. During phase n. 1, when the needles come out from the superior part of the bale chamber, crescents (no. 2 Fig. 15) moved by cam (no. 3 Fig. 15) catch the twine and take it to knotter hooks.
3. The knotter hooks moved by the semi-toothed gears (no. 5 Fig. 15) catch the twine ends brought by the crescents and the twine ends kept by the cord holder disc and tie them.
4. In the meantime the superior ends of the twines brought by the needles have been put into the notches of the cord holder disc (no. 11 Fig. 15) and have been held by these ones.  
The movement to the cord holder disc is transmitted by the semi-toothed gears (no. 5 Fig. 15) through the screw (no. 6 Fig. 15) and the gear (no. 7 Fig. 15).
5. At this point the ejector and knife holder arms (no. 8 Fig. 15) quickly moved by the proper existing cams in the central part of the semi-toothed gears, supply to cut the twine ends beyond the tier and to eject the knots from the knotters hooks.
6. The needles which are always moved by the drive crank are moved back to the starting position.

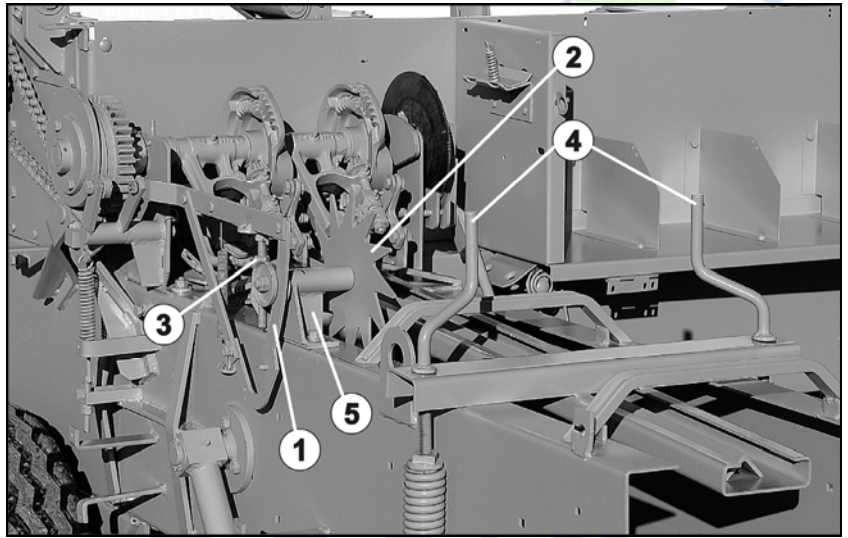


Fig. 4

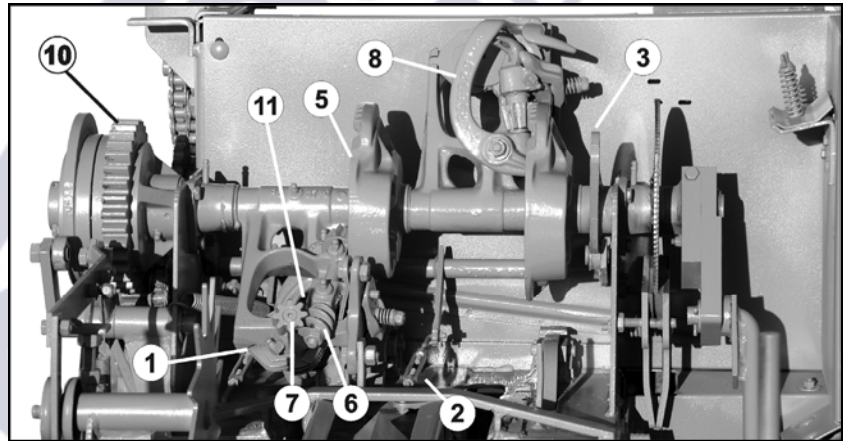


Fig. 15



### WARNING!

We suggest, for understanding how the bale-tie runs, to make a tie making the baler turn very slowly.



### ADJUSTMENT OF TWINE KNOTTERS

#### NEEDLE'S ADJUSTMENT

The adjustment is made with the screws 1 and 2 (Fig. 11).

To reduce the radius described by their ends in order to reduce their distance from cord holder disc while taking the twine to the knotter you have to loosen a fraction of a turn the screw no. 2 and to tighten a fraction of a turn the screw no. 1.

To increase such distance work in the opposite way.

To move them to the lateral side it's necessary to work on the needles deforming them as wished.

To obtain a perfect adjustment you must respect the following measure:

A) When the center of the small sheave on needles tip is at cord holder disc height (Fig. 17)

- distance between the knotter support and the needle min. mm 0,5 max mm. 2
- distance between the notch of cord holder disc and the needle min. mm. 30 max mm. 35

B) When the needles are at the end toward the knotter (Fig. 18).

- Distance between cord holder disc and the needle's tip sheave min. mm. 80 max. mm. 85.

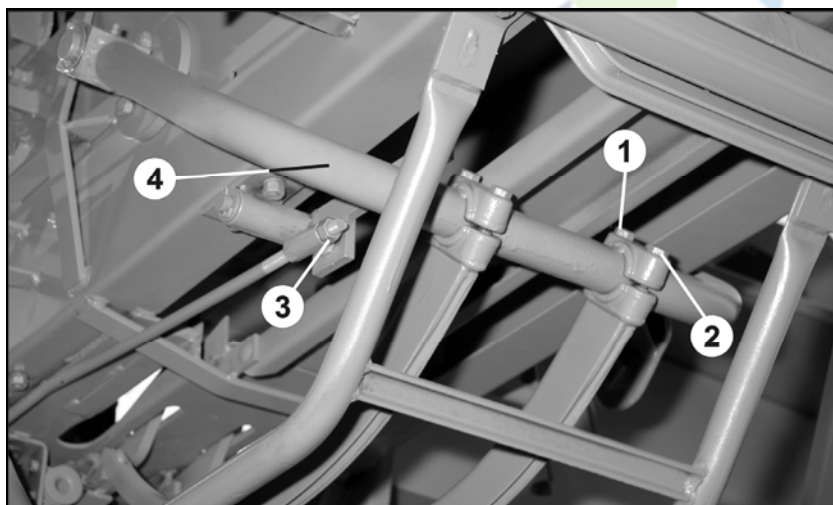


Fig. 11

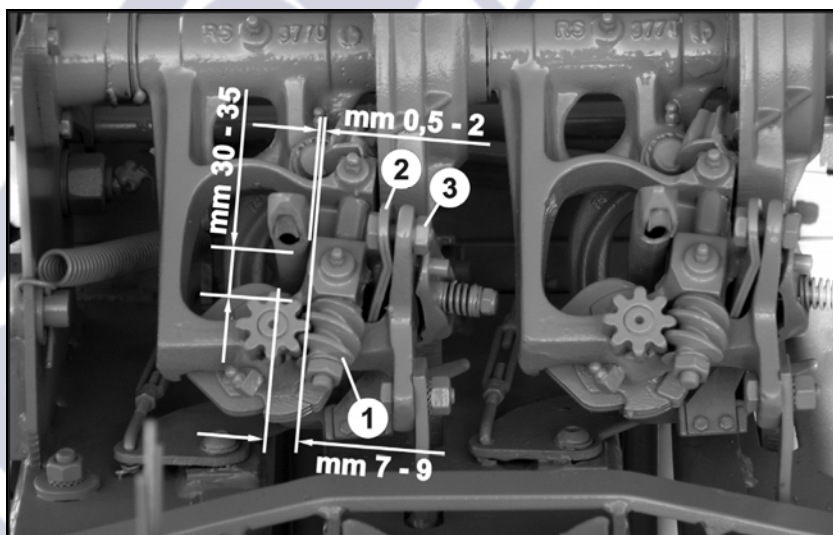


Fig. 17

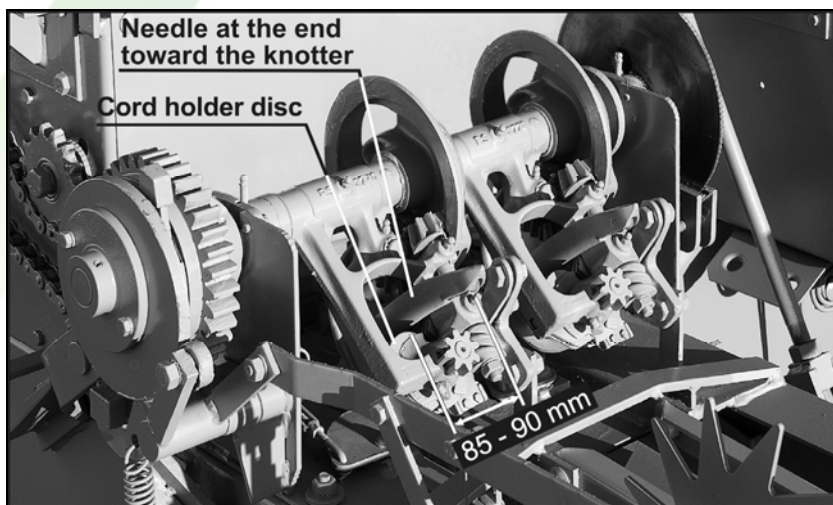


Fig. 18

### CORD HOLDER DISC ADJUSTMENT

The cord holder disc must be adjusted so that the twine brought by the needles is caught in the proper notches (Fig. 15). The adjustment must be done so that the distance between the knotted support and the notch's left edge of the cord holder disc is between 7 and 9 mm. (Fig. 17).

To operate the adjustment do as follows:

1. Loosen the nut about 3 mm. (nut. 1 Fig. 17).
2. Give a sharp blow on the nut with a hammer in the direction of the pivot where it moves in order to disinsert the screw gear (no. 6 Fig. 15) which is fixed by a taper.
3. Set the cord holder disc in the described position.
4. Turn the screw gear in anti-clockwise way to make it get in touch with the gear (no. 7 Fig. 15), to eliminate the influence of any clearance in the adjustment.



#### WARNING!

When a disk has too much of a delay, i.e. there is too much distance between the knotted support and the left part of the notch, the string may become tangled around the knotted tip.

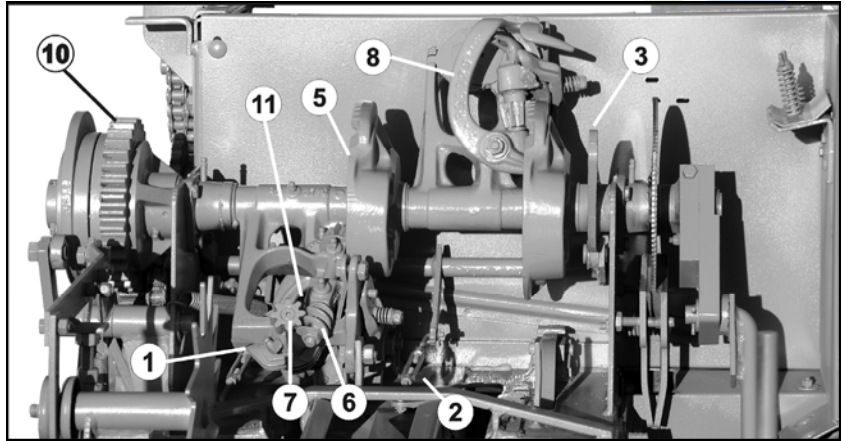


Fig. 15

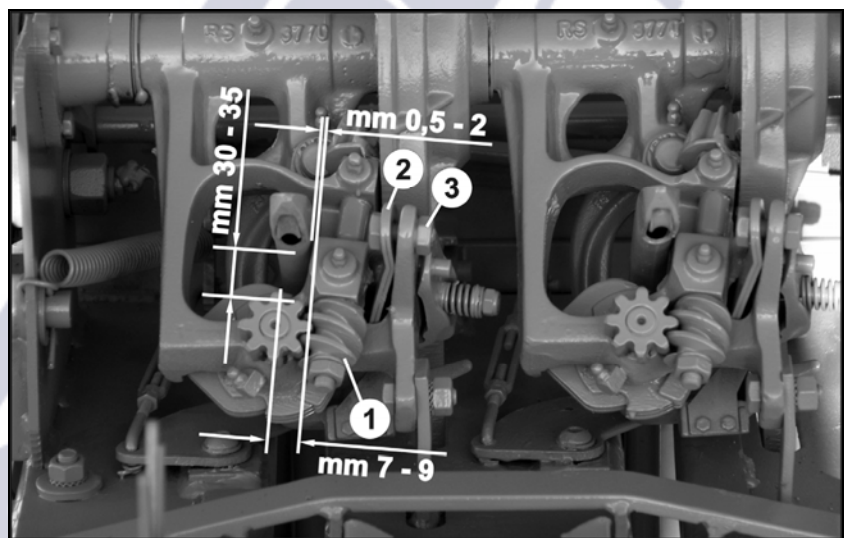


Fig. 17

### ADJUSTMENT OF THE PRESSURE ON THE CORD HOLDER DISC

The pressure on cord holder discs must hold the twine - taut by the proceeding bale - but in the same time it must allow the knotted hooks to unthread the necessary amount of twine for the formation of knots.

The pressure adjustment is made working on screw no.1 Fig. 9 and no. 2 Fig. 17 after loosening the lock nut no. 3 Fig. 17.

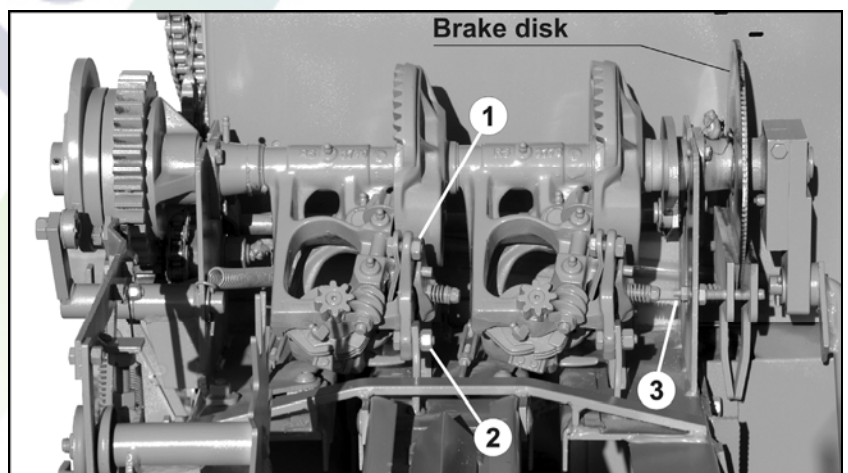


Fig. 9

### ADJUSTMENT OF EJECTORS AND KNIFE HOLDING ARMS

The ejectors and knife holding arms no. 8 Fig. 15, must cut the excess twine and it must take away the knots of the knoter hooks.

The knife adjustment does not exist.

The ejectors arms adjustment is on the contrary very important and must satisfy the following requirements:

1. The ejector tongue (no.1 Fig. 20) in its movements must rub with a smooth pressure on the back of the knoter hook (no. 2 Fig. 20).
2. The tongue is bent to follow the back of the knoter hook. The hook itself must hit it the centre the longue bend (Fig. 20).
3. The tongue in its own effect movement must go beyond the hook end not less than 6 mm. and not more than 12 mm. (Fig. 19). The check the adjustment of the ejectors arms and sharpen the knives take bolts 2 away (Fig. 9) (the knotters group you are dealing with) and lift to the top the knoter group as show in Fig. 15).

This operation must be done with the needles in rest position. When the knoter group is lifted the ejector arm follows its own movement and the check of the adjustment gets easy. To make the adjustment bend the ejector arm into the wished direction. For the adjustment 1 and 2, is not necessary to dismount the ejector arm nut. For the adjustment 3 on the contrary, it is necessary to dismount it.

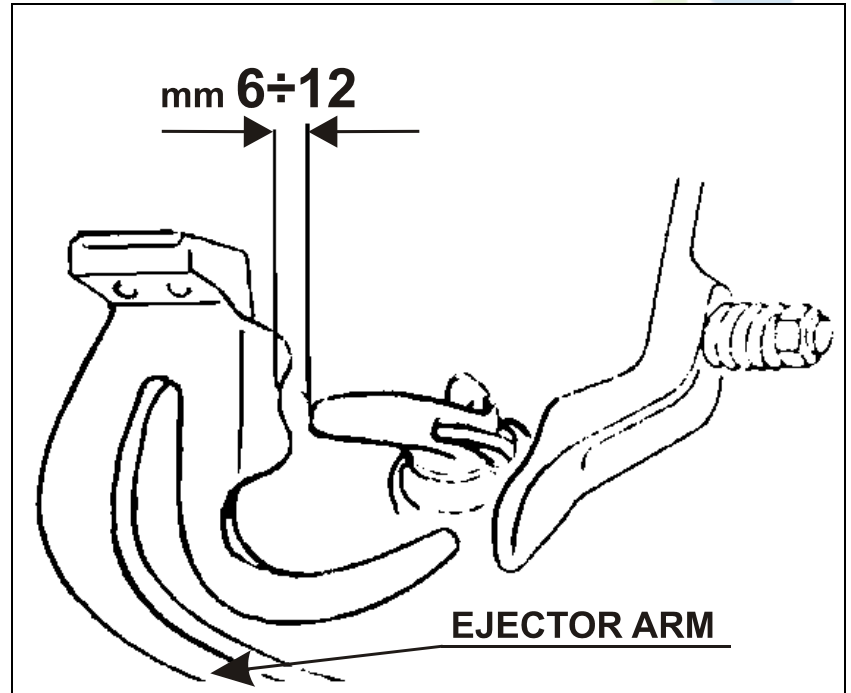


Fig. 19

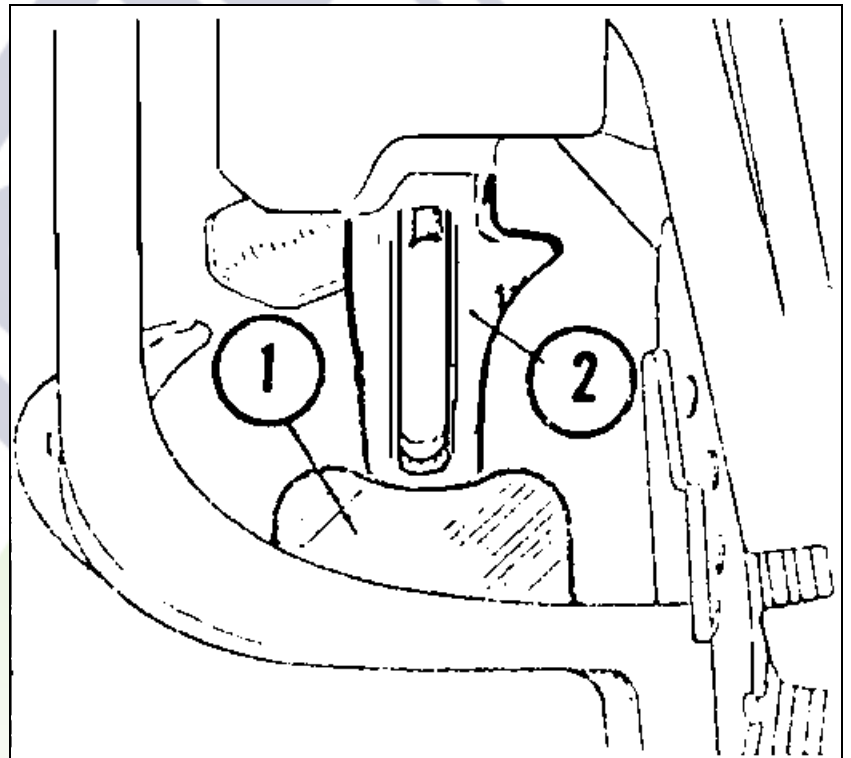


Fig. 20



**IRREGULAR OPERATION OF THE STRING BINDER**

PROBLEM	CAUSE	SOLUTION
The knot is formed only on the end of the string that was held by the clamp disk.	The point of the alignment device passes too far from the needle.	Adjust the needle and the aligner to obtain the max relevant distance = 5 mm
	Too much pressure on the clamp disk. In this case, there will be fraying instead of a clean cut at the end of the end of the bound part. The string taken by the needle was not taken by the clamp disk.	See "clamp disk pressure adjustment".
The string is not taken by the clamp disk.	Too much advance on the clamp disk. Needle incorrectly adjusted.	See "clamp disk adjustment". See "needle adjustment".
		Check that the reels are mounted as described in the chapter "string mounting".
	Product to be compressed very humid or too complex.	See the chapter "bale weight".
The knot has ends that are not pulled through (double loop).	Insufficient pressure on the clamp disk for which the knotter tip unwinds too much string.	See "clamp disk pressure regulation".
	Knife not sharp enough and tends to unwind the string from the clamp disk.	Sharpen the knife with very thin blade or with rock after having used the knotter unit as indicated in the chapter "Expeller arm and knife holder adjustment".
Ends of the knots frayed and poorly cut.	Knives not very sharp.	Sharpen the knives as indicated in the above solution.
The knots are retained by the knotter tip.	The expeller is not working correctly.	See "Expeller arm and knife holder adjustment".
	The mobile tongue of the knotter tip bends.	Straighten the tongue or even better replace the knotter tip.

### WHEEL MOUNTED BEHIND THE PICKUP

The baler is provided with a suitable bracket (no.1 Fig. 25) behind the pickup, at which may be fixed the wheel (no. 2 Fig. 25), after having pulled it out with its own hub from its original seat, (no. 2 Fig. 26). Doing so, you reduce the overall width of the machine by 20 cm.

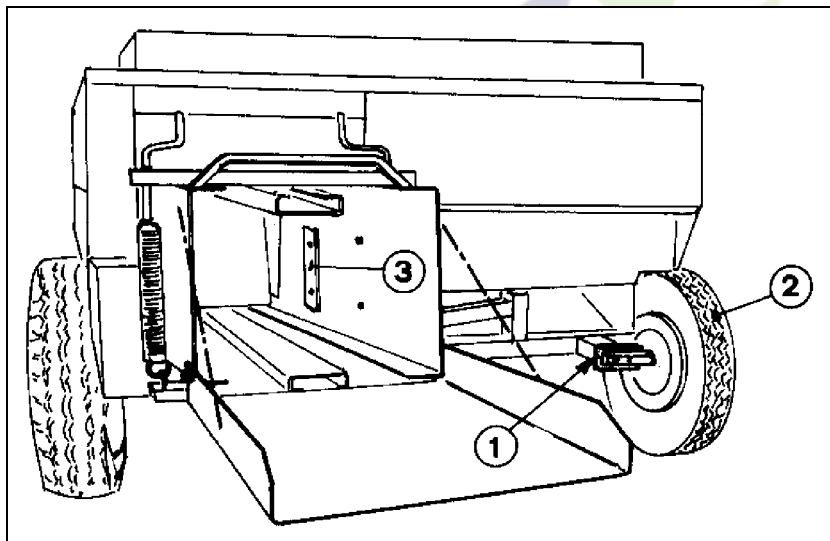


Fig. 25

### THIRD WHEEL

The baler can be equipped with a third wheel (which has a reduced diameter), to be installed at the pickup back, in order to protect it even on the rough grounds (no. 1 Fig. 26).

The third wheel bracket is the same one as above, but the hub of the third wheel is fixed at the two upper holes.

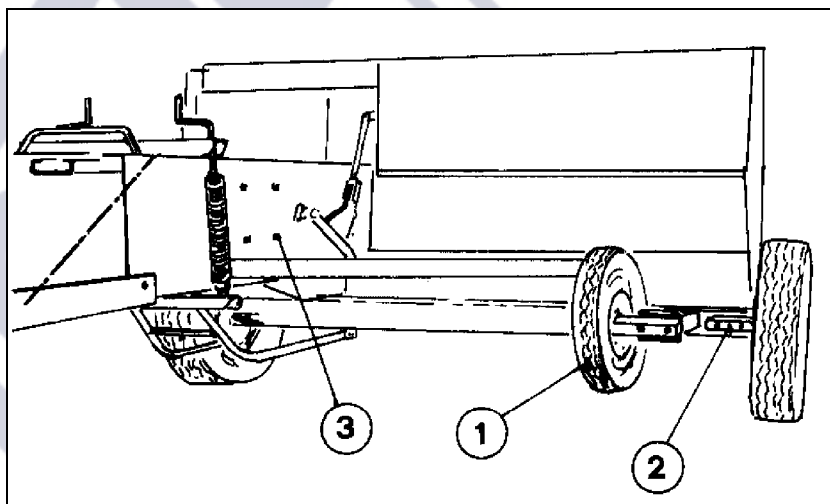


Fig. 26



## PICKER AND DRAWBAR HYDRAULIC CONTROL

The machine can be equipped with a hydraulic piston to move the drawbar (no. 1 Fig. 27) and a picker hydraulic lifting unit (no. 2 Fig. 27).

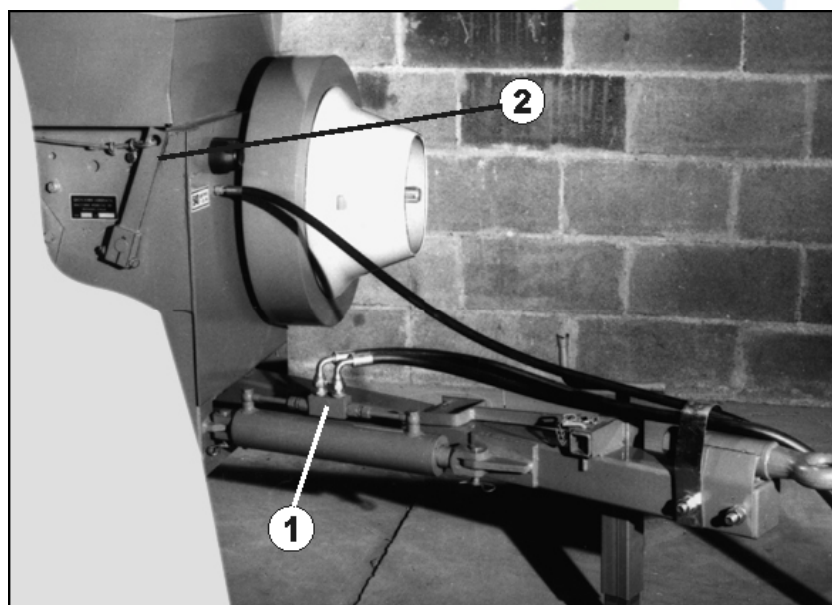


Fig. 27

## ASSEMBLY AND DISASSEMBLY

The machine described in this use and maintenance manual can be repaired, or disassembled, only by manufacturer authorized workshops.



### WARNING!

If the machine is used on very soft ground, the supplemental support foot must be used.

## TECHNICAL DATA

		MINI	SUPER
Bale tie		Twine	
Bale chamber	cm	34x44	
Straw bale weight	kg	13-20	
Hay bale weight	kg	18-28	
Bale length	cm	40-130	
Capacity bales/minutes		3-9	
Plunger strokes/minute		80-90	
Tractor rating for P.T.O.	CV	20-25	
Width of the pick up	cm	100	130
Weight	kg	900	1000
Overall width	cm	180	210
Overall width the side pick-up wheel mounted behind	cm	160	190
Height	cm	135	
Tires		195/75-14 o 7,00-12; 165-13	

The machine was built to operate with the universal joint turning at 540 rpm.

### SPECIAL EQUIPMENT

- Third wheel
- Trailing attachment
- Long chute for direct loading of bales on the trailer
- Wide-angle shaft
- Hydraulic pick up control
- Hydraulic drawbar control

### DRIVER SEAT NOISE LEVEL

Leq = 79.5 dBA

### SEASONAL START-UP

After eliminating all the harvest residues and disconnecting the binding system, and removing the string or mesh, then do the following:

- Thoroughly clean the interior and exterior of the machine. Dirt will lead to humidity that will create rust. If a high-pressure spray unit is used to clean the machine, do not aim the water jet on the bearings. Dry the machine.
- Loosen the V-belts.
- Inspect and disassemble the moving parts, such as belt tightening rollers, the cardan shaft, etc.; clean them and again check for wear. Replace them, if necessary, with new parts.
- Oil all parts of the cardan shaft.
- Thoroughly lubricate the machine.
- Clean the gears and change the oil, as previously described.
- Replace worn or damaged tools.
- Touch-up damaged paint and spray a rust inhibitor on bare spots.
- Store the machine in a dry environment and inflate the tires.
- Make a list of all the spare parts required and order them ahead of time (for your seller it will be easier to prepare the spare parts during the off season). In this way your machine will be ready for use for the new season.

### PREPARATION FOR THE NEW SEASON

- Eliminate the oil and the grease that was placed inside the machine for storage.
- Lubricate the entire machine to eliminate the condensation that may have formed in the bearings.
- Check the oil level. Top up, if necessary.
- Adjust all screws and nuts.
- Check all machine adjustments. Re-adjust, if necessary.
- Carefully re-read the use instructions.

ENGLISH

TRACTORTOOLS DIRECT